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EDITED BY WILLIAM HUNTING, F.R.C.V.S.

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THE CAMDEN TOWN ADDRESS.

All the five schools have now recommenced work, and to-day we publish the inaugural proceedings at the oldest—that at Camden Town. The attendance was at least quite up to the average; and the introductory address by Prof. H. W. Marret Tims was of much more than ordinary interest. Prof. Tims departed to some extent from the beaten path of these addresses. Generally they largely consist of good advice to the students; and this, however valuable it may be to such students as endeavour to follow it, is apt to pall upon the older portion of the audience. But Prof. Tims spent little time upon this; and devoted practically the whole of his address to an exposition of the bearing of his own subject of biology upon medical science in its widest aspect. The address must be read to be fully appreciated; and its merit and suggestiveness will be most apparent to those readers who, whether themselves practical biologists or not, are accustomed to follow the results of modern pathology.

We fully agree with Dr. Tims in his estimate of the importance of biology in the professional curriculum. The subject is of far more importance in practical medicine to-day than many clinicians recognise; and the whole recent history of pathology justifies the belief that the importance of the biological side will increase. We are not sure, however, that the Professor was not a little in advance of the time in recommending the establishment of a central biological bureau for the collection of data. Undoubtedly such a bureau is very desirable. But is its speedy establishment practicable? In the first place, it would require money—a serious obstacle to a veterinary undertaking. More than that, its success would depend upon the active collaboration of clinicians in supplying material; and very many general practitioners are still lamentably indifferent towards any scientific undertaking the immediate utility of which is not evident. That indifference is slowly disappearing; an increasing number of clinicians are habitually in communication with laboratories, and as the interdependence of the laboratory expert and the practitioner becomes more generally realised, such a bureau as that suggested will be accepted as an absolute necessity.

A NEW (?) SCLEROSTOME OF THE HORSE

By Prof. A. E. METTAM.

The life history of the nematode worm known as Strongylus armatus, or more correctly as Sclerostoma equinum armatum, is not completely understood, and more's the pity, since its ravages claim yearly a large mortality from its victims. The present note is to give a description of a parasite we recently met with, merely prefacing it by a quotation or two which have some relation to the matter in question.

On page 408 of Neumann's "Parasites and Parasitic Diseases of the Domesticated Animals," 1892 edition, we find the following:

"We ought at least to mention the opinion given by Willach* on the phases of development of the sclerostomes. He found in the intestine of the horse, independently of armed sclerostomes having the usual dimensions, small worms 7 mm. to 12 mm. long, which he believed were of the same species, by reason of the shape of their cephalic extremity. Some were manifestly females, and contained numerous eggs having a thin shell, and measuring 80μ long and 40μ broad. Others had a caudal pouch similar to that of the armed sclerostome, and had, in addition, eggs like those of the female just described, but less numerous. Therefore these worms were hermaphrodites; one even showed, alongside the mature eggs, embryos ·5 mm. long. Willach consequently admits that the armed sclerostome has a phase of development—a rhabditiform generation, issuing on the spot in the intestine of the horse from the well known normal worms. The female rhabditiform sclerostomes also deposit their eggs on the same place, but with the hermaphrodites, which have no vulva—the embryos are hatched in the body of the parent, and they only escape therefrom by the destruction of the internal organs, caused by their movements. These embryos, expelled outwards or continuing their development in their first host, become eventually the normal sclerostomes."

In Friedberger and Fröhner's "Veterinary Pathology," Vol. I., Capt. Hayes translation 1908, page 254, there is mention of the above paper of Willach, and also a note referring to Sticker's observations. The latter author distinguishes three varieties of S. armatum, namely S. edentatum (hookless), S. bidentatum (two hooked), and S.

*P. Willach. Sclerostoma Armatum und Tetracanthum Die Biologische Stellung des Pferdedarmes unter den Nematoden. *Archiv. f. Wissen u. Prakt. Thierheilkunde*, xvii., 1891, p. 108.

quadridentatum (four hooked) etc., but there is no mention of a parasite at all comparable to one I have met with.

The specimen was brought into the laboratory by Mr. J. McKenny, M.R.C.V.S., and consisted of a portion of intestine (colon), and in connection with it what was considered as a tumour. This tumour was the size of a child's head, and was found to be an aneurism of the colic artery; it had ruptured, and the resulting hæmorrhage had been the immediate cause of death. Agamous larvæ of the usual type were found in the aneurism.

In the lumen of the intestine, however, and reposing between the folds of mucous membrane, mixed with the ingesta present, was a minute worm, whitish in colour, thickness of a fine hair, and about a quarter of inch in length (measurements gave from 6 to 8 mm.) Microscopic examination of the parasites showed;

(1) That it was a sclerostome:
(2) That there were females and males present, the former as usual predominating in numbers, but not greatly in size.
(3) That the females contained eggs, and that these eggs were actively dividing, as examples up to the morula stage were readily found.
(4) That the caudal bursa of the male was altogether different from the caudal bursa of the male commonly found in the intestine.

There is no doubt as to the character of the worm. It is a sclerostome, as the photo shows. The circular ring of teeth can readily be seen, with the six hooklike papillæ around the buccal aperture. As will also be recognised, the strong muscular œsophagus is that of a sclerostome.

The females contain eggs. The parasites average from 6 to 8 mm. in length by about 306*u* thick. The eggs measured in the oviduct are from 100 to 120*u* by 68*u*. The shell is thin and translucent. The contents in various stages of division to the morula stage. There are no signs of embryos.

The caudal bursa of the male has the outline of a pegtop, or of a pear. The peg of the top, or stalk of pear, being directed backwards. The bulging portion of the bursa on each side carries ribs or rays as follows: They are six in number, the first two curved slightly forward (cephalic); the third points directly outwards; the other three backwards (caudal). The sixth ray is the longest of these.

The prolongation of the bursa is supported by four rays, two long—the middle pair; the rays on each side of the middle pair are shorter than the middle rays, but they are themselves of equal length. When carefully focussed and viewed as an opaque object the arrangements of the rays is found to be as follows: the long and shorter rays of the peg-like prolongation are split from a common stem, which apparently also gives origin to the last rib of the lateral dilated portion of the bursa. This rib should, therefore, properly be described as belonging to the middle prolonged segment of the bursa and not to the lateral portion.

It will be observed then, from this brief and rough description of the caudal bursa, that this worm differs considerably from the male of S. equinum.

In the female the worm tapers towards the posterior end, which is slightly splayed and pointed. In both male and female the cuticle is delicately striated transversely.

THE ESCHAROTIC ACTION OF CARBOLIC ACID.

A cowman having found that his bottle of liquid carbolic acid B.P. had become crystalline, put it in the cow byre over one of the cows with the intention that the heat would again melt it before morning. At the same time he laid the bottle on its side and slightly loosened the cork. During the night it gradually thawed and dropped on to the cow, the subject of the accompanying photograph.

Strange to say the animal showed no signs of carbolic acid poisoning. The skin, however, in the course of a few days became hard and leathery, which caused some interference with movement, and then began to peel off leaving a large red granulating sore. The skin peeled from the external iliac angle to the hock, The photograph shows a large patch of leathery skin hanging off and projecting outward about the middle of that region.

HENRY TAYLOR, F.R.C.V.S.

ON QUACKS AND QUACK MEDICINES.

By E. WALLIS HOARE, F.R.C.V.S.

The evils produced by quacks and quack medicines may be considered from two points of view. *First*, the injury and often cruelty inflicted on the animals, and the loss sustained by the owners. *Secondly*, the injustice done to qualified practitioners. The first may be regarded as the philanthropic point of view; the second includes professional protection.

When the new V.S. Act Amendment Bill was first brought forward it contained clauses that dealt very effectively with the question of professional protection and the suppression of quackery. Hence it received marked support, and the already overtaxed practitioners who were in favour of it did not object to saddling themselves with the permanent addition of a guinea per annum in the form of a compulsory tax. However, the opposition of the quacks and of those who believed in the employment of this c lass of individuals proved too strong, with the result that in its present mutilated form there are many practitioners who would wish to know, if the Bill becomes law, what further professional protection is likely to be secured.

At present the number of quacks show no sign of diminishing, and the efforts of many of the agricultural papers on their behalf would seem to have given them redoubled vigour. No doubt the original efforts of the promoters of the Bill were too drastic to succeed, and had the effect of stirring up the noble army of quacks rather than of exterminating them.

In spite of the so-called enlightenment of the present age, no one can deny that many individuals believe firmly in the skill possessed by quacks. To country practitioners this is especially apparent. The quack does but little doctoring to human beings in the present day as compared with former times, the deficiency is made up in the enormous amount of patent medicines sold.

People are more careful of their own bodies than of their animals, hence the latter are more often subjected to the tender mercies of the empiric.

It has often been said that a qualified man in a district can, after a time, exterminate the most notorious of quacks. In a way this is true, but the quack adopts ways and means which the qualified man with any self-respect would not stoop to.

No doubt the harm done by quacks to qualified men is often exaggerated. Far more damage accrues from the "veterinary" chemists and patent medicine vendors. These cannot be interfered with by Act of Parliament or by any form of legislation, and as the "veterinary" chemist is often a prescribing as well as a dispensing individual, he takes a large amount of what should go into the pocket of the practitioner.

Ultra-dignified practitioners, who are independent, or who have already laid by the "nest-egg," may say that we should live by fees and not by the sale of drugs, or by keeping a forge. This looks well on paper, and sounds majestic when stated in a post-prandial oration. It is especially interesting when we know that the orator has earned his independence by the practice of those methods which he now condemns. But no matter to what extent the scientific aspect of the profession may attain, it is highly probable that the sale of drugs must always be carried on as an adjunct—and a very important one.

Judging by the enormous number of patent medicine firms that are flourishing and pushing their wares into every district and every stable, it is quite clear that the practitioner must adopt steps to check the invasion. To do this he must convince the owners that he can supply far better articles and at the same price. This is a commercial attitude, but after all one has to pay his way and live, and there is little sympathy for the arranging debtor who has endeavoured to live by dignity alone.

Considering the results of the popular veterinary lecturer's efforts, which are best known to country practitioners, it would appear as if opportunities for practice were becoming conspicuous by their absence. In a recent issue of an agricultural paper a page is devoted to a list of medicines, headed by a paragraph that these were prepared for the convenience of those who were attending County Council veterinary lectures. Strange to say this paper is edited by a veterinary surgeon, and published by a firm who sell patent medicines.

It must be admitted that members of the profession do not always exert themselves to put down quackery and the sale of quack medicines. Unfortunately there are some who from apathy do not dispense medicines, but send their clients with prescriptions to a chemist. Some, indeed, adopt methods to obtain practice which are on a par with, or even lower than those adopted by quacks. Other men's clients are personally canvassed, and when this does not succeed servants are bribed in order to accomplish the desired end.

The cutting of fees to a starvation limit is freely carried on.

Can we wonder that the owner of animals occasionally show a lack of respect for the profession when such practices are indulged in?

While freely admitting the evils of quackery, one must also remember that members of the profession who adopt the methods of the quack are a far greater evil, and are distinctly more detrimental to the calling.

ABSTRACTS FROM FOREIGN JOURNALS.

Intoxication of the Horse by Atropine.

Edouard Lövy records (*Allatorvosi Lapok*) his experience of the treatment of rheumatic lameness in the horse by subcutaneous injections of atropine. He has sometimes used this treatment for rheumatic shoulder lameness; and on each occasion he has observed symptoms of intoxication so serious as to apparently endanger the life of the horse. The doses of atropine employed, however, were small; and Lövy points out that they were inferior to those indicated by Fröhner, who, in his treatise upon therapeutics, advises the administration of from 5 to 10 centigrammes (approximately from ¾ to 1½ grain) as a subcutaneous injection.

Lövy, with the aim of preventing possible accidents, associated morphine with the atropine, his formula for one injection being—Hydrochlorate of morphine, 4 centigrammes (about 7/11ths grain), Sulphate of atropine, 2 centigrammes (about 1/3rd grain), and distilled water, 10 grammes (about ʒiiss.)

His first case was in a four-year-old Hungarian horse of Oriental origin. Alarming symptoms quickly appeared after the injection; the horse was restless, the pupils were dilated, the eyes protruded from the orbits and the mucous membranes were intensely congested. Pressing against the wall, falling, looking round at the flank, and repeatedly making efforts to urinate, were other symptoms seen. The pulse was accelerated and the respiration panting. All these symptoms disappeared at the end of from 16 to 18 hours.

Lövy, thinking that these symptoms were due to non-observance of the diet which had been ordered, repeated the same injection the next day. The same symptoms of poisoning made their appearance. The day after this, the fourth part of the previous dose of atropine was given, and was only followed by dilatation of the pupil.

A cure of the lameness was obtained in four days. Two months later, however, the lameness reappeared, and was then treated with small doses (5 milligrammes, or about 1-13th grain) of atropine, under which treatment it again disappeared in a very short time.

Lövy injected several other horses with his earlier dose of 2 centigrammes of atropine, and invariably witnessed the symptoms of intoxication described above. He therefore concludes that the dose of atropine given by Fröhner is too high for Hungarian horses and for those of Oriental type.—*Annales de Med Vet.*

[In the latest English translation of Friedberger and Fröhner's "Veterinary Pathology" (the sixth German edition, published in Germany in 1904) it is stated (page 579) that "the combined use of morphia and atropine in rheumatism of the shoulder in the horse is contra-indicated, on account of the dangerous by-effects (colic, symptoms of poisoning) which it provokes." The injection of *veratrine* is recommended on the same page, but not that of atropine. Apparently Lövy refers to some earlier or later opinion of Fröhner's.—TRANSL.]

CALCULI IN THE BOVINE MILK DUCT.

Calculi in the milk passages of the cow may be single or multiple. Cases have been recorded in which they have attained the size of a nut or even of a chestnut, and necessitated a longitudinal incision of the side of the teat for their extraction.

Hamoir, of Bois-Borsu, in an extensive experience of the affections of the bovine udder and teats, has only met with one case of calculus. This was in a cow which had calved some weeks before; and which, in her previous calvings, had never been troubled with any affection of the mammary apparatus.

Since the recent calving, however, mulsion of the left front teat had yielded a jet of milk which was quite healthy, but which frequently was entirely interrupted for a short time, as if the orifice of the teat had been suddenly closed by a valve. From these frequent interruptions it took nearly an hour to milk out the teat.

Hamoir could discover nothing abnormal by palpating the teat, except perhaps a slight hardness in the neighbourhood of its orifice. He supposed that a polypus of the mucous membrane, with a rather long pedicle, existed at this point; and that this polypus, by reason of the free movement which its pedicle permitted, was enabled at intervals to occlude the lumen of the teat.

He therefore introduced a teat curette (Strebel's) into the teat; but, despite repeated attempts, he only succeeded in withdrawing some small pieces of the *débris* of the mucous membranes. The obstacle continued to plug the teat intermittently as before.

Hamoir then seized the extremity of the teat between the thumb and the other fingers of his left hand, and exercised very strong pressure from above downwards. He thus succeeded in causing a rounded body to project from the orifice, and was able to seize and withdraw this with a pair of fine-toothed forceps. This body proved to be an oval calculus, about 1-5th inch long, and from 1-8th inch to 1-6th inch thick, lobulated, and having the colour and consistence of hyaline cartilage.

No ill effects followed the forcible extraction, and the milk supply continued without interruption.—*Annales de Med Vet.*

ACCIDENTAL PARASITISM OF THE MAMMARY GLAND.

Moussu (*Rec. d'Alfort*) records the following novel and curious case of accidental parasitism. The subject was a Dutch cow, six years old, which had calved about four months previously, and in whose milk creatures closely resembling small worms were found from time to time.

When examined by Moussu, the animal was in good health; and there were no external signs indicative of mammitis. The milk, however, was yellowish, thick, curdled, and mixed with sanguineous streaks and filamentous sanguineous clots; thus presenting all the characters of milk in the first stage of an ordinary epithelial mammitis. When filtered upon fine cloth, the milk left a residue formed of clots, in the midst of which the presence of parasites was ascertained. These were of vermicular aspect, cylindrical, not acuminate at the extremities, reddish in colour, and from 1-25 inch to 4-10 inch in length. They were extremely active in their movements.

The sphincter of the extremity of the teats was relaxed. As soon as the galactophorous sinus was slightly distended, the milk began to issue drop by drop from the teat—a condition, as the author remarks, which certainly predisposed to an eventual infection.

The parasites were only emitted in very small quantities at each milking, four being the maximum number; and the morning milking was the one which most frequently yielded them. Microscopic examination under a low power at once showed that they were not nematodes, as their naked-eye appearances had suggested, but the larvæ of insects, and finally they were considered to be the larvæ of *Chironomus*.

The probability is, that during a sojourn the cow had made in humid and marshy pastures, the teats had come into contact with pools of stagnant water containing *Chironomus* larvæ. Some of the larvæ, perhaps attracted by the milky oozing from the extremity of the teats, had been able to penetrate into the galactophorous sinuses, and from thence into the milk canals of the depth of the gland. As the larvæ were carriers of microbial germs, it is permissible to suppose that the mammitis had been consecutive to their penetration into the galactophorous system. On the other hand, it is possible that a traumatic action of the larvæ upon the mammary epithelium may have caused the elimination of blood clots with the altered milk, The buccal armature of the larvæ appeared strong enough to injure and wound a delicate tissue.

No treatment could be instituted, the cow having been sold.—*Annales de Méd. Vét.*)

W. R. C.

[It is not definitely stated how many of the quarters were affected; but it seems rather to be implied that all were.—TRANSL.]

NOTES ON LIFE HISTORY OF THE OSTRICH WIRE WORM (*Strongylus Douglassii*).

By Wm. Robertson, M.R.C.V.S., Director Veterinary Laboratory, Grahamstown.

[Abstract].

It is nearly 30 years since the late Hon. Arthur Douglass, of Heatherton Towers, first noticed the presence of this parasite in his birds and first recognised it as a serious menace to the industry. Specimens of the wire worm were shown to Dr. Becker, Grahamstown, and also forwarded to Prof. Cobbold, the famous English Parasitologist. This latter savant examined and minutely described the structure of the worm in the proceedings of the Linnean Society, from which publication the following notes are copied. I make no apology for reproducing this extract, as I fancy that it has never yet appeared in a publication accessible to the general public :—

"On the 23rd of March, 1880, I received from South Africa two bottles, the larger one containing part of the proventriculus of a young ostrich preserved in spirit, and the smaller one a quantity of loose vegetable *débris*, in which were several nematode worms. These were sent by Mr. Arthur Douglass, of Heatherton Towers, near Grahamstown ; and, by letter, I was informed that the bird yielding the parasites had not died in consequence of the disease from which it was actually suffering, but had been purposely destroyed on account of a broken leg.

"Speaking of the proventriculus as the 'paunch corresponding with the crop of other birds, Mr. Douglass says to me in his letter :—'You will find vast numbers of small entozoa in the mucus. A medical gentleman who examined them believes them to be a totally unknown worm, and Mr. Douglass's statement and his friend's inference are correct. The parasite represents a new species ; and in my reply to the discoverer, I provisionally named it *Strongylus Douglassii*. Judging from the material sent, the number of parasites in this bird must have amounted to several thousand."

As a general statement all birds (ostriches) are infected with wire worm, and in all degrees, and the extent to which the parasite will affect its host depends to a great extent, if not altogether, to the condition in which the bird is kept and fed ; in other words, if a bird is fed well and well looked after, its constitution can support both itself and the parasites, but if the food runs short or living condition becomes unfavourable the parasite must be served at the expense of the bird's constitution which, therefore, suffers.

I have never seen a bird badly affected with wire worm under twenty days old, but I have met with month old chicks where the lining of the stomach was simply alive with the parasites.

I have seen the viscera of wild birds which were badly affected, and I understand from travellers and sportsmen that a similar, if not identical wire worm causes much mortality amongst the Emu of Australia.

The symptoms of the disease are a general falling off in condition, a disappearance of the yellow subcutaneous fat (so noticeable in healthy well doing birds), a pallor of the pink lining of the mouth and throat, and some breeders state an increase in the amount of chalky deposit voided with the urine and dung. A curious feature of a bird affected with wire worm is its refusal to eat mealies, dry barley or other hard grain, this may be explained by the fact that the ingestion and subsequent digestion of such hard food is impossible or at least very harmful in the inflamed condition of the bird's stomach.

Some breeders state that a heavy death rate will follow if wire worm chicks from dry veld are suddenly changed to fresh green lucerne paddocks.

Birds under all conditions can be, and are infested with wire worm, and the infestation is greater and more universal when the paddocks, etc., are old and fouled with the birds ; there is no animal in agriculture which will foul a kraal or lucerne land quicker than an ostrich, and one meets with fewer wire worms when the birds are running on new farms (as far as birds are concerned) than amongst those running on the farms belonging to the pioneers of the industry. This is a fact worth noting : that the men who take up new land are more exempt from parasites and diseases than those who are, as I said, on settled farms.

Fifty-five birds of various ages and various types (principally what are termed veld chicks) were taken and five killed at random, they were found, as was expected, to be infested with wire worm, the stomach contained respectively 3, 5, 7, 6, and 4 millions.

These figures were approximate, but probably correct, to 5,000 parasites. The fifty birds remaining were then dosed every fortnight with Lime and Sal ammoniac and shifted to clean scherms (they were hand-fed) after every dosing. After the fifth dose two birds were killed, the worm count had fallen to 5,000 and 7,000. These figures were probably nearly correct, as the count was made with great care. After four more dosings three birds were killed and the worm count had again fallen to 100, 70, and 22. These remaining forty-five birds were now shifted clean away and confined in lots (15) in three separate kraals over thirty miles from one another, and in kraals which had never had a bird near them. One lot was in my own yard in the kraal which was made by myself, and which has only held Redwater cattle. These forty-five birds were fed and watched for six weeks, their dung was frequently examined for wire worm eggs, and one killed showed 23 worms in the stomach.

I obtained from a set of badly infested birds some dung (fresh) containing millions of wire worm eggs, and to one lot of birds I gave pieces—about six ounces—of this dung (that is, one lot of fifteen). These birds were killed at intervals :—

2nd	1	bird killed	70	worms found.
5th	1	"	40	"
7th	1	"	38	"
10th	1	"	72	"
12th	1	"	12	"
16th	1	"	73	"
20th	1	"	over 200	"
22nd	3	"	badly infested, over 2000 worms found	
25th	5	"	1 contained 100,000 worms ; other 4 average 1,000,000 ; all might be called infested	

The result of this experiment is most interesting, and though there are chances of error, we are fairly safe in assuming that *the incubation period of the eggs of the S. Douglassii is between seventeen and twenty days* ; of course the figures given are approximate and liable to error, but as the parasites were all counted after the same plan any one error would balance the other.

Summary.

Birds rendered as far as practicable free from wire worm, and which remained free for a considerable time, and were kept out of reach of any probable chance infection for six weeks, were given a large quantity of wire worm eggs, and in *eighteen* days showed an enormous increase in the number of parasites in their stomachs.

The experiment will be repeated, but it is very trying and worrying work, and very hard on the eyes. The examining and counting have to done by artificial light.

Dosing for Wire Worm.

Personally—and my opinion is shared by nearly every ostrich farmer I have met—I do not believe that we will ever get a drug, or drugs, which will clear the wire worm right out of a bird at one dose, and, even if we did, I should be afraid to use such a drastic remedy. The most we can hope for is a dose which will kill a percentage of the parasites at every administration, and which does the minimum amount of harm to the bird. The drugs used are legion, but the chief is carbolic acid. Personally, I have not had good results from its use, and have seen disastrous and fatal effects follow its administration. It is used extremely strong, so strong as to act as a caustic, as anyone who has dosed with it can tell by his fingers and the blancing of the bird's mouth lining. It is also a chemical fact that carbolic in the presence of Albumen becomes inert (in fact, one of the antidotes to carbolic acid poisoning is the white of eggs). The thick, tenacious, slimy, mucous, thrown out by the stomach glands as the result of the wire worm irritation, is very rich in albumen, this can be proved by dropping it on to a hot plate, or into boiling water, when it will at once coagulate, just like the white of an egg similarly treated. This is what frequently happens in the bird's stomach, the acid runs down the lining and bleaches it white, no doubt killing the worm it touches, but beyond that becoming fixed and inert, and the shock of crude carbolic acid applied to an inflamed surface (already scalded and excoriated with paraffin) often sends the bird waltzing and staggering about in an agony of pain, and I have never got reconciled to seeing the dosed bird reeling, and often lying in a helpless condition (or in too great pain to move) for hours after.

Carbolic acid kills wire worms when it touches them, but it is, as I said, a very drastic and often dangerous dose.

I believe that that one of the fruitful causes of bars in feathers is a "set back" to the system (Prof. Duerden), and that a common direct cause of that "set back" is *overdosing* with carbolic acid amongst other things.

I have personally proved that overdosing with carbolic acid will bar the "body blacks" of a cock, with white lines, and I have seen a bird marked like a guinea fowl by persistent and continued overdosing.

Various compounds of carbolic acid have been recommended, and are used by various breeders in the shape of many of the proprietary cattle dips, but they in common with many other liquid doses all have the same fault, viz., the parasites are all in the upper half of the bird's stomach, and to reach them, and submerge them, in the drug, the stomach must be filled, and frequently this is an impossibility, as the fluid runs out at the gut end of the stomach, before it reaches the parasites.

I tried "Lysol," a carbolic derivative, which is claimed to possess all the germicide properties of the acid without its poisonous characters; giving it both pure, and in solution, but without any favourable result. In fact, the solution killed the birds, and the drug burnt the lining of the stomach, just where it lay, and close up the edges of the burnt mucous membrane were live and presumably healthy wire worm.

Many things will kill *S. Douglassii*, but the difficulty is to get these things in contact with the wire worm, so many factors are against the dose, and it is useless to pick off worms from the stomach, and because they die in a glass of a certain fluid, claim that fluid to be a worm destroyer. If anyone wants to test a wire worm medicine, let him dose, and kill the birds after, and I am sure he will be surprised to find how little affected the parasites are by any drug. I again repeat that we cannot hope to clear out wire worm from birds as we do tape worm in a dog; the best we can do is to keep these parasites down, and within bounds, by careful and systematic drenching with some substance which will get rid of a percentage of the worm, with a minimum deleterious effect on the bird.

[Mr. Robertson then comments on other reputed remedies—Copper Sulphate, proprietary Tar dips, Formaldehyde, Cooper's arsenical dip].

Lime and Sal Ammoniac.—I am still favourably impressed with the value of these drugs as a remedy for wire worm in the ostrich, and in view of the results following experiment will carry out some work in connection with the steady and regular dosing of birds at eighteen days intervals. Many farmers are using this dose with success, and safety, and with the ostrich at its present value, it is worth while to dose at intervals rather than try to rid the bird of parasites at once and risk killing it.

[Next follows instructions as to dose of the preparatory Paraffin for various ages, and of the Lime and Sal Ammoniac, of which :—"I have given as much as two ounces each of Lime and Sal Ammouiac, and though the bird certainly seemed distressed, it was more due to the mechanical evolution of amm onia gas than the chemical effect of the drugs. The effect of the medicine is very slight and soon passes off." The article concludes with remarks on

Dosing Birds.—Though an ostrich has a neck and throat like a six-inch drainpipe, he requires some care and precaution in dosing. The following remarks are not intended for the expert ostrich farmer (to whom I am indebted for most of my information on the subject) but to young beginners.

When possible always precede the wire worm dose by some cleansing substance to remove from the stomach walls the sticky covering (which protects the parasite). Petrol or Paraffin are both good.

If possible dose on an *empty* stomach, the drug loses much of its value when mixed with a stomach full of food.

Use a suitable bottle, varying with the size of the birds. I find a nice series to be :—A Castor Oil bottle, a small Van Riebeek bottle, and a long-necked Drakenstein bottle.

Tin bottles with an air hole are on the market. I do not fancy them; the mouth gets rough and the finger slips from the airhole, and one gets the drug over the face and clothes.

If using Carbolic Acid always have a bottle of oil at hand; if you overdose, or the bird seems to feel the effects of the dose very much, a few ounces of oil given will render the Carbolic Acid in the stomach quite inert and harmless.

In dosing with Petrol for tapeworm be particularly careful that none enters the windpipe, otherwise you will kill the bird. Never dose in wet weather, and when possible avoid extreme cold.

In starving chicks remember that they are not all alike in strength, and always dose the weakest first, so as to let the strongest have the longest fast.

Never give a heavy feed after dosing (with anything); give a few mealies or a little chopped aloes.

Further work is in progress in connection with ostrich diseases, the result of which will be published in due course. But I find that experiment with ostriches must be carried out as far as practicable under farm conditions, so many things act against the bird when kept in a kraal, and sometimes results occur to which we are in doubt in ascribing a cause whether due to disease or alteration of surroundings, and this moving about in connection with ostrich experiments takes up a lot of time and results are slow in accumulating.—*The Agricultural Journal* (Cape of Good Hope).

ROYAL VETERINARY COLLEGE.

The introductory lecture at the opening of the Winter Session of the Royal Veterinary College, Camden Town, was delivered on Monday afternoon, October 3rd, by Prof. H. W. Marett Tims, M.A., M.D. Mr. W. Hunting, F.R.C.V.S., presided over a large and enthusiastic meeting, among those present being Sir John M'Fadyean, Principal; Mr. W. Freeman Barrett, President R.C.V.S.; Major-General Fred. Smith, C.B., Director-General Army Veterinary Department; Mr. McRow, Secretary, Royal Agricultural Society; Mr. Stewart Stockman, Chief Veterinary Officer, Board of Agriculture; Messrs. W. J. Mulvey, W. Shipley, George Thatcher (Solicitor, R.C.V.S.), Fred Bullock (Secretary, R.C.V.S.), Rogerson, MacCormack, and Profs. Wooldridge, Woodruff, Almond, Hobday, Shave and Macqueen.

ADDRESS.

The Relation of Pure Science to Practice, with Special Reference to the Phenomena of Parasitism and Inheritance.

By H. W. Marett Tims, M.A., M.D., F.L.S.

Professor of Biology, Royal Vet. Coll., London.

In my student days it was customary to devote a considerable portion of an introductory address to the delivery of a homily upon the correct conduct of youth. In Shakespeare's words we were bidden

> "To live and study here three years.
> But there are other strict observances;
> As, not to see a woman in that term;
> And, one day in the week to touch no food;
> And, but one meal on every day beside;
> And then, to sleep but three hours in the night
> And not be seen to wink of all the day."

It is not my intention, however, to take up your time in this fashion; were I to attempt to do so, your answer to such would doubtless be the same as that of Biron to the exhortation just quoted, namely—

> "O, these are barren tasks, too hard to keep;
> Not to see ladies—study—fast—not sleep.

Nevertheless, without unlocking a stream of moral platitudes, I would wish on behalf of my colleagues and myself to offer sincere congratulations to the prize winners; may they "Go on and prosper," and to those now entering upon their College career we extend a sincere welcome. I hope you will soon feel at home, and that you will from the first take a real interest in all the activities of your College life, its sports and its societies.

The true value of a collegiate life is derived from the judicious combination of the intellectual and social sides. The one fits you for your professional career, the other (and it is of scarcely less importance) teaches a man "to aid and bear a part in all actions and occasions." It should, moreover, be the period of life for making friendships, for "Whosoever is delighted in solitude, is either a wild beast or a god," to quote the words of Aristotle. I *know* you are not wild beasts. I *presume* you are not gods. Friendships are therefore very necessary; for,

"If a man have not a friend he may quit the stage."

I would therefore urge upon all who are now joining to take an active, but not a too engrossing share in the college games. Cultivate *esprit de corps*. The success of the collegiate life in the older Universities is largely due to this spirit. It is what we of the London Colleges, more particularly those Colleges constituting the University of London and among the number of which I hope this College will very shortly be included, require more and more, and which we ought to do all in our power to foster. A healthy spirit is just as necessary for the life of an institution as of an individual.

It is, however, to other subjects that I wish to draw your attention for a short time to-day.

Not being a member of your profession, it would be an impertinence on my part were I to attempt to address you upon a subject immediately concerned with veterinary practice or politics. I have therefore selected a more general topic, and one upon which I feel myself somewhat more competent to speak, viz., the relation of so-called "pure science" to practice, with special reference to the phenomena of parasitism and inheritance, and incidentally the place and importance of biology in a medical curriculum. I may say in passing that in using the terms "medicine" and "medical" I refer to both human and veterinary, for the problems in both cases are similar, and I believe the educational aims to be identical.

It is often asked by the student and by the "practical" man, What is the use of biology in the medical curriculum? Why should the student be required to waste time over the anatomy and physiology of animals for which he will never be required to prescribe, or at whose confinements he will never be called in to assist? Such questions are not altogether unnatural from a student in his first year, since he cannot be expected to realise the full import of the subject. The more serious objector is the fully qualified man, the post-graduate, whose proud boast is that he is essentially nothing if not practical man, and who is ever insisting on the fact that medicine is a practical subject. It is to such an one that I would address my remarks, and attempt to show that while not under-rating in the very least the value of the practical applications of science, nevertheless it is to the pure biologist (using the term in its widest sense) that nearly all the more important advances in biological knowledge are due, to prove, in fact, what the President of the British Association so recently said at Sheffield—that the modern Universities have to prove, "that abstract thought is not antagonistic to practical work, or scientific research to the labour of the factory or foundry," and may I add, or practical medicine. "The one and the other can harmoniously co-operate in the advance of knowledge and the progress of civilisation."

The pure science man works at his subject with the sole object of acquiring and extending knowledge, of investigating the laws of nature without any particular thought of practical applications. This is beyond doubt the highest aim. Unfortunately among such there is sometimes a tendency to belittle the practical side; indeed some extremists appear almost to go so far as to think that if a subject can be shown to have an economic or utilitarian aspect it ceases to be scientific, or at least, is of less interest. In my opinion such views are unfortunate, and such men lay themselves open to the stigma of being regarded as visionaries, or even "cranks" with but little knowledge of the world. On the other hand the purely practical man is often a man of equally limited outlook, too apt to gauge every scientific fact by the sole standard of utility, and the utility is but too often estimated by the monetary value derivable from the application of the scientific facts. For, if we analyse this modern cult of the practical, I think one is bound to admit that the main underlying considerations are but too often mercenary.

While fully realising that the majority of students are destined to become practitioners, earning their livelihood by the practical application of scientific facts, I am afraid there is a danger of bending the knee too much and too often to the Baal of practical utility. We require, I think to realise more fully than is often done that the "pure scientist" and the "practical man" are both equally necessary, that one is the corollary of the other; and in this faith I would urge that medical education should be as broad as possible and not regulated entirely

by motives of immediate utility. The student, while his mind is in a receptive state, untrammelled by the cares of income-earning should be taught the more theoretical aspects of science upon which his future practice should be based; his mental outlook will thereby be broadened, and I venture to think that the student who has been trained in general principles and scientific methods will, in nine cases out of ten, turn out to be the better practitioner.

Faraday, the results of whose researches have had such far-reaching effects, was one day asked by a lady in a somewhat depreciatory tone what was the use of his researches? His simple but pregnant reply was—"Madam, What is the use of a baby?" I think it may fairly be stated, at any rate of the biological sciences, that all the most valuable practical results have been the outcome of researches which in the first instance and taken by themselves appeared to have no value beyond that of scientific interest.

Who, for example, would have imagined at the time that the simple experiment of Van Helmont would prove to be the starting point of such important and far-reaching results. Van Helmont planted a willow tree of known weight in a tub of dry soil, also of known weight. After a period of five years both were again weighed, and from the resulting differences certain deductions were drawn as to the transformation of water into the material of the tree. This apparently useless experiment in reality was the basis upon which, as Mr. A. D. Hall has recently pointed out, the super-structure of modern and rapidly extending science of agriculture has been erected.

Again, turn to the academic researches of Pasteur upon the growth and nutrition of the yeast plant, his work in connection with fermentation, and perhaps more than anything else his researches, commenced in 1865, into the causation and prevention of silkworm disease, and note how they paved the way for the dominating germ theory of disease. To quote the words of the distinguished American Protozoologist, Calkins, it is of no importance that the characteristic black spots of pébrine were not recognised by Pasteur "as the spores of a protozoon, but the important results which followed their discovery, and which led to increased length of human life, and to the mitigation of human and of animal suffering throughout the civilised world, would make an increasingly substantial monument to the patience, courage and virility of this man of pure science, who, by the apotheosis of scientific method, proved these unknown corpuscles to be the cause of this silkworm disease."

The controversies over the cell-theory, and the bitter controversy over the theory of spontaneous generation, brought the knowledge of the protozoa, both parasitic and free-living, prominently before the biological world, but not till nearly a quarter of a century later did the protozoal origin of disease find any acceptance, and it is only within the past few years that these ideas have become unshakably established. Though the researches of Pasteur did so much to stimulate the study of micro-organisms, members of the two great groups of pathogenic protozoa, the Hæmoflagellates (to which the trypanosomes belong) and the Sporozoa, were known before Pasteur's work on the silkworm disease. The first trypanosome appears to have been discovered by Valentin in 1841, in the blood of the trout. Very shortly afterwards Remak and Berg noted their presence in other fishes; then followed the discovery of these organisms in the blood of frogs, birds and rats. The first trypanosomes met with in disease was by Griffith Evans in 1880, who found them in horses suffering from Surra in India. Then came Schaudinn's classical work on the *Trypanosome noctuæ* of the little owl, and Bruce's brilliant researches in 1895 when he discovered the parasite of Nagana, the tsetse fly disease, in the blood of infected horses and cattle, and the important part played by the fly in transmitting the parasite.

With the more recent work on sleeping sickness and Malta fever you are all familiar.

So, too, with the sporozoa; undoubted Gregarines were noted in invertebrate animals before the close of the 18th century, and as early as 1839 Hake published investigations upon the spores of the coccidium of the rabbit. In 1841 Johannes Müller described many new forms in fishes. These led on to other researches, which culminated in the discovery in 1880 of the malaria parasite by Laveran.

Koch regards the discoveries of Bruce and of Laveran, together with that of the parasite of Texas fever in cattle in 1893 by Smith and Kilborne, as the three great landmarks in the history of our knowledge of the pathogenic protozoa, each of which opened up new and wide fields of fresh investigation, until as Prof. Minchin (7) has said "So great is the interest which these parasites excite at the present time, on account of their pathogenic properties in man and beast, that now scarcely a month passes without the publication of some discovery relating to them, and the study of the protozoa bids fair to assume in the near future a position of importance scarcely secondary to that held by the science of bacteriology."

Thus we see that the early discovery of these important organisms was due to the labours of men of pure science, who found them in the lower vertebrates and in some invertebrates, and that they, unimportant as they appeared to be in themselves, formed the basis of the later work which has been of such incalculable benefit. Indeed, it is safe to say that bacteriology and the whole principle of antisepsis and asepsis, as well as of protozoology take root in the classical researches of Pasteur. The discovery of the causation of these protozoal diseases has led on to their prevention and treatment. Nuttall's discovery of a cure for piroplasmosis is of the utmost importance, and the reduction of animal mortality bids fair to result in the saving of thousands of pounds annually. Is it too much to expect that the active researches now being prosecuted all over the world into the causation of cancer, to which the cytological researches of Farmer and Moore gave such an impetus, may before long lead to similar practical results?

Turning now to the Metazoan parasites. The more systematic study of their effects upon the blood of the host has yet hardly been entered upon, or its importance so generally appreciated. The life histories of some of the commoner Cestode and Nematode worms have been known to us for several years, and for a great deal of this knowledge we are indebted to our own countryman Cobbold, a former distinguished lecturer on Parasitology at this College, but there is yet much to be done. The brilliant and patient researches of Loos, extending over many years, and from which he came so near to sacrificing his own life, have shown conclusively that the larvæ of *Ankylostomum duodenale* can penetrate directly through the human skin and that of puppies, when brought into contact with water containing the larvæ. In Neumann's Animal Parasites it is stated that "Humidity has at all times been considered as one of the most predisposing causes to the invasion of the economy by worms. Rainy years are marked by the extension of various forms of helminthiasis in animals which graze; and these affections are more marked among animals that frequent inundated pastures and swampy places and the borders of lakes and ponds." This is explained by the ova being preserved in water and being taken in when drinking. May there not be a possibility, at any rate in some cases, of a direct iufection through the skin such as Loos has shown to be the case in the Miner's worm. If such a possibility should turn out to be correct, then mere attention to the drinking water would be of no avail, the animals should not be allowed to frequent "swampy places or the borders of

lakes and ponds." It seems to me that such a question would be worth while investigating.

It may be said that the presence of intestinal worms is on the whole of comparatively little moment, since so many animals are infected with so little proportionate disturbance of the economy. Krabbs states that 67% of all dogs have intestinal entozoa. This objection may be true to some extent as regards certain entozoa being the direct and immediate cause of serious symptoms, but there is no doubt that they may act as the indirect and predisposing causes of much more serious affections. Their mode of attachment to the intestinal wall causes a lesion through which bacteria or other organisms may gain admission to the blood and lymph. This point has been insisted upon by Dr. Shipley who cousiders that many cases of appendicitis in the human subject associated with the presence of parasitic worms in the intestines and in the appendix itself, are to be explained in this manner. Further, evidence in the same direction seems to be forthcoming in the findings of the commission into the causation of grouse disease.

But I do not think we are even here at the root of the matter ; there is, I believe, in many cases something more. The parasite in not in all cases the mere mechanical agent so to speak, preparing the way for the entrance of other organisms to perform their deadly work. The convulsions, the spasmodic movements, and all the other nervous symptoms to which infected animals are liable are usually ascribed to irritation of the nerve endings, that is to say to mechanical causes. There is reason to believe that the parasite in itself is injurious.

I wish to draw your attention to some recent interesting and remarkable facts concerning parasitism in the crustaceæ. It is well known that certain crabs are liable to be infected by another parasitic crustacean. The male crab-host is easily recognisable from the female by certain well marked differences in the secondary sexual characters, differences in the appendages, in the breadth of the tail, and in other respects. The parasite commences life as a free-swimming form but ultimately becomes attached to the abdominal appendages of its host and there undergoes degeneration, becoming in time converted into a globular mass, without definite organs, and from which spring long processes penetrating into the tissues and organs of the host. The effects of this parasite upon its *male* crustacean host are most remarkable ; the secondary sexual characters are transformed into those of the female, so that the infected males have been constantly mistaken for females. In addition to this Giard, Geoffrey Smith, and Potts have shown that the effects of the parasite is to cause dwindling and ultimately an entire disappearance of the genital glands, and on account of this effect Giard gave the name "Castration Parasitaire." Infected females show very little modification of the external characters, but the ovary is reduced or obliterated. The still more remarkable observation has been made that the completely modified males may occasionally recover from the parasitic infection and regenerate the genital gland, in which case they become perfect hermaphrodites, the gonads producing both ova and spermatozoa. Comparable phenomena are now known to occur in very many classes of invertebrate animals, though the alteration of the secondary sex characters is not always so marked a feature as in the crustacea.

In Mozambique there is, according to Turner, a very prevalent idea that impotence and sterility accompany bilharziosis in the human being, but I know of no definite proof of the interference with the fertility among vertebrate animals due to parasitic infection. Nevertheless, I think it is a point worth bearing in mind, as it might be of some practical importance in relation to the value of infected animals for breeding purposes.

What these researches do show is that the parasite has a very marked effect upon the metabolism of the host. How that effect is brought about, whether through the action of a secretion into the body of the host, or whether by some interference with the normal hormones of the host, as has been suggested, it is as yet quite impossible to say. I would suggest that a useful line of work in the first instance would be to make an extract of the crustacean parasite and inject it into normal uninfected males and see whether effects similar to those caused by the parasite itself can be produced, and thus to determine the point as to whether or not the effects are caused by a secretion from the parasite.

I would note in passing that the parasites known at present to cause deterioration of the genital glands are those found in the body cavity or in the blood spaces, and not the gastro-intestinal parasites, but that these latter have in some cases a marked effect upon the blood of the host has been amply demonstrated. A good deal of research has been devoted to the changes produced in the human blood by various endo- and ecto-. parasites, some of the more important results of which I may briefly mention.

Of the Cestoda, *Tania Solium* and *T. saginata* cause but little effect and that of a transitory nature, the effect being limited to the Eosinophiles but in the Cysticercus stage there is marked Eosinophilia. On the other hand the results of infection by *Dibothriocephalus latus* are of a much more serious nature. In the blood of Taenia —in infected persons, as I have just said, the leucocytes only are affected, whereas in Dibothriocephalus infection the effect is almost entirely confined to the red cells, in many cases giving rise to so profound an anæmia that it is only distinguishable from true pernicious anæmia by the fact that the patient recovers on expulsion of the worm. The character of the blood in these cases is "a marked oligocythæmia, a high colour index, the presence of nucleated red cells of the megaloblastic type, the appearance of deformed red poikilocytes and cells showing polychromatophilic staining."

Hydatid disease due to the Cysts of Echinococcus gives rise to a general and serious leucocytosis.

Of the Nematodes, cases of infection by the common *Ascaris lumbricoides* are reported in which, in addition to an Eosinophilia, the red blood cells have been reduced to half the normal number.

The very marked anæmia of Egyptian Chlorosis due to infection by *Strongyloides intestinalis* is well known to everyone.

It is not necessary to multiply examples, but the point upon which I wish to insist is that, when one takes into account all the facts of parasitic infection, we are forced to the conclusion that the parasites generate some poison which affects the host to a greater or less extent, and that the leucocytosis is a protective effort on the part of the host. The anæmia is to be regarded as a result of infection, and not merely a predisposing cause as stated in some of the text-books ; and further that this anæmia is caused by some toxic influence due to the parasite. I suppose that it is possible that immunity to those effects can be established, and for that reason the frequent infection of dogs does not give rise to more serious symptoms than it does, though as we have seen, the cestodes, even in man, give rise to but slight changes in the blood.

Is it not probable that not only the anæmia, but all the other symptoms of helminthiasis, the convulsions, epilepsy, vomiting, etc. are all due to this toxic infection ?

There is a sentence in Neumann's book which seems to me to point out a line for further researches ; he writes "there are symptomatic manifestations that properly belong to each kind of domesticated animal and to each species of parasite." May this not be indicative of a different toxine (I use the word for want of a

better in our present ignorance) for each parasite, or of differences in the chemistry of the blood of the different kinds of host, or of both?

It seems to me that there lies here before us a wide field for research, for the further application of the opsonin theory, and possibly paving the way for an antitoxine treatment of helminthiasis.

Let me turn now to a subject of even greater importance.

Heredity.

Of all the advances in biological science of recent years none are of wider interest or of greater practical importance to the breeder, and one may say to the human race, than the discovery of certain principles of heredity by Gregor Johann Mendel. This great man, born on July 22nd, 1822, at Heinzendorf of Austro-Silesian parents, entered as a novice the Augustine, at Altbrünn, and afterwards became a teacher of Natural Science at the Realschule in Brünn. It was during this latter period (1853—1868) that he devoted much of his time to the crossbreeding of a large variety of plants. Upon his appointment as Abbot of his monastery in 1868 his scientific activities were considerably curtailed by the duties associated with his new office; nevertheless, the work of the preceding fifteen years had been sufficiently great and his records so careful and exact as to have formed a very solid foundation upon which a vast superstructure is being daily raised by workers in all countries.

Mendel's first experience in hybridisation were made with the eating pea—*Pisum sativum*— and his results were published in the proceedings of the Natural History Society of Brünn in 1866. For over 30 years his work remain unknown until in 1899 the main facts were rediscovered by de Vries, Tschermak and Correns, and in our own country they have been brought prominently before the world by Bateson, who, with his pupils Punnet and Doncaster has added so greatly to our knowledge of heredity. Before drawing attention to the great practical application of Mendel's work I may briefly outline the principles, taking for illustration oue of his own experiments.

He selected plants with pairs of characters, such as tallness and shortness, and made crosses between the tall and short varieties, selecting only those which he had proved to breed "true." Tall plants alone resulted from the first crossing. The character of tallness he called Dominant and that of shortness he called Recessive. The seeds from these tall forms were collected and sown again the next year, and in the resulting second generation, some plants were tall and others short in the nearly accurate proportions 3 : 1. If the seeds of the dwarf forms were then planted they gave rise to nothing but dwarf forms for however many generations they were carried on; *i.e.* they bred true. But if the seeds of the tall forms were planted it was found that they again gave rise to tall forms, but by growing them through further generations he showed that they were not all of the same nature, some were pure tall, others impure tall, in the proportions of 1 : 2. That is, that the pure tall now breed true like the recessives of the previous generation, whereas the impure dominants (tall) again yield dominants and recessives in the constant proportions of 3 : 1. We thus see that a dominant tall form may be a pure dominant and will therefore breed true, or it may be an impure dominant, *i.e.* though it appears as a dominant tall form it really carries the recessive character of shortness within, though latent, as proved by the fact that some of the descendants of the next generation will exhibit that dwarf character.

Large numbers of characters have been dealt with in the same way, both in plants and animals. The coloured coat of mice and rabbits is dominant over the albino coat. The short fur of rabbits is dominant to the long "angora" coat; the "rose" comb of Wyandotte fowls is dominant to the "single" comb of Leghorns and Andalusians.

Prof. J. B. Wood has also shown by crossing Dorset horn sheep with the Suffolk hornless breed, that horns are dominant in the male, recessive in the female.

Cases are, however, met with in which the hybrid of the first generation is intermediate in character between the two parents as is shown by crossing a lax-eared with a dense-eared wheat. But when the seeds of the hybrid are sown the next generation gives one quarter dense, one quarter lax, and two quarters intermediate, the last again behaving in the same way in the next generation. The dense and the lax thus reappear after skipping a generation, and then continue to breed true.

In an address of this nature it is impossible to go into the various explanations of the results and of the various theoretical deductions as to gametic segregation, gametic coupling, etc., but they are all adequately dealt with in books devoted to Mendelism. I wish now rather to draw your attention to experiments on the same lines in respect of characters of marked practical importance.

Prof. Biffen, of Cambridge, finds that there is a variety of wheat which is rust-proof, a small-eared variety without any good qualities beyond its immunity to rust. Auother variety is exceedingly suscceptible to rust, but formed long ears. These two varieties have been crossed and Biffen finds that immunity to rust acts as a recessive character. By definitely selecting the crossings through several generations, it is found possible to get a wheat "which will bake as well as the best Canadian, and since they will be free from disease, crops better than any varieties at presents on the market." To quote again from a paper by Professors Wood and Punnett—this "possibility of transferring immunity to disease from one variety to another is an achievement of the greatest scientific and practical importance. It seems to offer the most hopeful method of checking disease yet suggested. If immune strains of any species of plant or animal can be found, no matter how useless they may be from other points of view, there seems to be no reason why their immunity should not be transferred by crossing to our present valuable varieties which are being ravaged by disease. In this way it may be found possible to produce high-class horses and cattle immune to the diseases which are the scourge of the South African farmers, sheep which will be proof against anthrax, black quarter and other diseases that attack sheep at home, and pigs immune to swine fever."

It may be that some may regard these possibilities as Utopian and not justified merely by what has been found possible in wheat. Is there any evidence that disease in animals behaves as a Mendelian character? From the nature of the case the evidence in animals is as yet much more scanty than in plants, but it is quite sufficient to raise most sanguine hopes.

Some very remarkable pathological examples of Mendelian heredity in the human being are the cases of brachydactyly investigated by Farabee in America, and Drinkwater in Edinburgh. This condition, affecting both hands and feet and associated with short stature, is a dominant character, and behaves in a simple Mendelian way.

Without going into details, it is possible from a study of these cases to confidently prophesy that no unaffected member of the family will transmit the disease to his or her children, but that it will most certainly be transmitted by the affected members and by them only. Congenital cataract is another condition which seems to behave as a simple Mendelian dominant to the normal. (8)

These are comparatively simple cases, but there are those of sex-limited diseases, where the disease is present generally, if not always, in members of one or

other sex only, for example males; in such cases the females, unaffected themselves, may and usually do transmit it to their sons, but not to their daughters. This is the case with some forms of hereditary night-blindness; the males only are affected, with descent through the normal sighted females.

Several other diseases are under investigation—Hereditary chorea, Diabetes insipidus, Deaf-mutism, Hæmophyllia and many diseases of the eye and nervous system.

It is getting now possible to predict with some degree of accuracy which of the offspring, male or female, of an affected person will in turn be affected. Beyond prophecy and advice little can be done with human beings; "Man will aye gae his ain gait" and "wilful woman will have her way." But in the case of animals this is quite different.

May we not see here opening up a field of vast importance to the breeder and to the veterinary surgeon. One more point before I close. I would like to draw your attention to a very suggestive paper by Major F. Eassie, D.S.O., of the Army Remount Department published in the Scientific Proceedings of the Royal Dublin Society for March last on "Some variations in the skeleton of the domestic horse, and their significance." The author gives proofs of deterioration in the domestic horse as compared with the wild horse

Though the evidence furnished is not sufficient to state that the points in a horse dealt with in the paper do behave as Mendelian characters, the paper seems to me to be extremely suggestive of the lines upon which breeders might work in the selection of their animals. As the breeding of horses and the improvement of the breed are now very much to the front, I would commend this paper to your notice.

Time will not permit me to go further into these interesting and important subjects, I hope I have said sufficient to prove the thesis with which I started, that all these matters whether in regard to Parasitism or to Heredity are of immense practical value, and that they all had their origin in the apparently useless work of the pure scientist. We see here an answer to Faraday's question—What is the use of a baby?

Further, I hope I have successfully demonstrated the value of a knowledge of Biology to the student, and its importance as a subect in the veterinary and medical curricula. The shafts so constantly aimed at Biology should as a rule be aimed not at the subject, but at the syllabuses which educational authorities lay down. Taught, as it should be, with due regard to general principles, I hope the day when biology is banished from our Medical Colleges and relegated to the position of a school subject, may never come. It would then be taught by untrained persons whose sympathies might be in entirely other lines, possibly not even scientific, and without any regard to its future application by the student.

It seems to me to be becoming more and more evident that the centre of gravity of medical education is shifting from the pathological to the biological laboratory, and hence rather than crushing the subject it will have in the future to be more and more fostered. The great importance of Biology has been recognised in the University of Cambridge by the foundation within the past few years of two chairs of Biology; the Quick Professorship held by Professor Nuttall and devoted more particularly to the subjects of Protozoology and Parasitology, the other chair now occupied by Professor Punnett, and previously by Professor Bateson, for the study and investigation of all problems connected with Heredity.

I am aware that we are all open to the charge of believing that our own particular subject is of all others *the* most important, but I do seriously think that the importance of Biology in the Medical curriculum is not sufficiently appreciated. In addition to the general elements taught to first year's students, I think a second and more applied course should be taken by the more senior students concurrently with their pathology, dealing not only with Parasitism and Heredity, but with the animals which are so important in the transference of disease, Leeches, Flies, Ticks, Mosquitos, and now even Carcinology is coming to be recognised as of importance.

I am of opinion that the Biological departments of our Medical Colleges should be given functions, wider and more important than the teaching of first year students in the elements of Biology as a sort of introduction to Anatomy and Physiology, and to fill up their time until they have passed Chemistry and Physics. Biologists ought to take an important share in the teaching of senior students and post-graduates. I am referring not to this College or to the Veterinary curriculum only, but to all Medical Colleges, all Medical Education. And above all I would like to see them becoming centres for research. Research I regard as a most important factor, stimulating both teacher and taught. Where no research is carried on, both teaching and learning are apt to become mechanical, lifeless and uninteresting.

Your Profession, extending as it does throughout the world, has its focus in this Metropolitan College. There is no other place where such subjects as the *phenomena* of parasitism (not merely the collecting, identification and cataloguing of specimens) and the hereditary transmission of disease, and I would add also of the transmission of desirable qualities in animals, could be better studied, owing to the vast stores of available materials.

May I conclude with a practical suggestion. It is that there should be established in this College a central Bureau for the collecting of data, supplied by the members of your profession who are in practice and in touch with the material, and who have such ample opportunities for helping. The collecting of such data would give them an active interest in the work, keep them in touch with their College and would add greatly to our knowledge.

The ever recurring objection, want of money, will be at once raised. Would it not be possible to form an association of former students, each member subscribing a guinea, or even half a guinea a year, to found a post-graduate Research Studentship to investigate some of these important and pressing questions? As soon as some practical results were forthcoming, I have sufficient faith that some of our more wealthy men interested in horse and cattle breeding would come forward and help. As men of affairs they naturally will not put money in a slot from which nothing is to be extracted.

Finally, I would commend this suggestion not only to the Governors of this College but also to the notice of the Royal College of Veterinary Surgeons. They could do no work more useful to the profession and to the community at large than to establish a department for collecting and working out all questions relating to heredity in animals.

The CHAIRMAN, in proposing a hearty vote of thanks to Dr. Marett Tims for his lecture, said he did not quite gather from the lecturer whether he claimed that the subject he had dealt with was the most important of all, but he was sure all present were convinced that it was one of the most interesting, at any rate as described by Dr. Tims. Personally, he did not think he had ever heard a lecture which had suggested to him the immeasurable effects upon life of the infinitely small so much as the one to which he had just listened, nor did he ever remember hearing a lecture which suggested how much practical good might result from the thorough study of the infinitely small. Even to agriculture alone,

a thorough grasp of the life history of parasites through the aid of the veterinary profession might save perhaps more money than was now lost by nearly all the diseases from which animals suffered. (Cheers.)

The resolution of thanks having been carried by acclamation,

Dr. MARETT TIMS briefly acknowledged the compliment.

The PRINCIPAL (Sir John M'Fadyean) then read the Prize List.

On the motion of Major-General Fred Smith, C.B., a hearty vote of thanks was accorded to Mr. Hunting for his conduct in the Chair, and the proceedings terminated.

PRIZES AT THE OPENING OF THE SESSION, 1910-1911.

Coleman Prizes.—Silver Medal: Mr. B. Gorton; Bronze Medal: Mr. D. A. E. Cabot. Certificate of Merit: Mr. D. Meadows.

Centenary Prizes.—Class A: Mr. H. W. Dawes. Class B: Mr. S. J. Gilbert. Class C: Mr. G. F. Steevenson. Class D: Mr. B. Gorton.

Royal Agricultural Society's Medals.—Silver Medal: Mr. D. Meadows. Bronze Medal: Mr. R. C. G. Thwaytes.

Ralli Prizes in Practical Surgery.—1st Prize, £5 5s: Mr. A. H. McDougall. 2nd Prize, £3 3s: Mr. W. K. Stephens. 3rd Prize, £2 2s: Mr. D. Meadows.

Clinical Prizes.—Class A—1st Prize: Mr. W. H. Priston. 2nd Prize: Mr. H. Dawes. 3rd Prize: Mr. A. R. Smythe.

Class B.—1st Prize: Mr. K. J. S. Dowland. 2nd Prize: Mr. V. Boyle. 3rd Prize: *Eq.* Mr. S. J. Gilbert, Mr. J. M. Smith.

Class C.—1st Prize: Mr. G. F. Steevenson. 2nd Prize: Mr. G. V. Golding. 3rd Prize: *Eq.* Mr. F. G. Buxton, Mr. R. E. Leach.

Class D.—1st Prize: Mr. B. Gorton. 2nd Prize: Mr. D. Meadows. 3rd Prize: Mr. H. D. Sparrow.

Class Prizes.—Class D. Veterinary Medicine—1st Prize: Mr. B. Gorton. 2nd Prize: Mr. D. Meadows. Veterinary Surgery.—1st Prize: Mr. D. Meadows. 2nd Prize: Mr. B. Gorton.

Class C. Pathology.—1st Prize: Mr. G. F. Steevenson. 2nd Prize: Mr. C. Holland. Hygiene.—1st Prize: Mr. C. Holland. 2nd Prize: *Eq.* Mr. J. T. Edwards, Mr. G. F. Steevenson. Materia Medica.—1st Prize: Mr. C. Holland. 2nd Prize: Mr. J. T. Edwards.

Class B. Anatomy, Histology, Physiology.—1st Prizes: Mr. S. J. Gilbert. 2nd Prizes: Mr. P. R. Viljoen.

Class A. Chemistry and Toxicology—1st Prize: Mr. H. W. Dawes. 2nd Prize: Mr. H. Hicks. Practical Chemistry—1st Prize: Mr. R. C. G. Hancock. 2nd Prize: Mr. H. Hicks. Biology—1st Prize: Mr. G. F. Marais. 2nd Prize: Mr. H. W. Dawes. Minor Anatomy—1st Prize: Mr. A. R. Smythe. 2nd Prize: Mr. H. W. Dawes. Physics—1st Prize: Mr. G. F. Marais. 2nd Prize: Mr. G. van de W. De Kock.

DISEASES OF ANIMALS ACTS 1894 TO 1903, SUMMARY OF RETURNS.

Period.	Anthrax.		Foot-and-Mouth Disease.		Glanders (including Farcy)		Counties Affected	Sheep Scab.	Swine Fever.	
	Out-breaks	Animals.	Out-breaks	Animals.	Out-breaks	Animals.	Animals Attacked	Out-breaks	Out-breaks.	Slaughtered. *
GT. BRITAIN. Week ended Oct. 1	29	29			11	19		4	24	196
Corresponding week in 1909 ...	27	33			9	38	Essex 3	5	16	130
Corresponding week in 1908 ...	15	19			8	61		2	25	224
Corresponding week in 1907 ...	18	39			12	22	Kent 3	3	34	206
Total for 40 weeks, 1910	1115	1324	2	15	303	878	London 12	354	1114	10060
Corresponding period in 1909 ...	1013	1343			429	1538	Notts 1	481	1339	12117
Corresponding period in 1908 ...	835	1111	3	112	643	1993		649	1618	9624
Corresponding period in 1907 ...	846	1133			679	1547		424	1995	9418

Board of Agriculture and Fisheries, Oct. 4, 1910.

							Parasitic Mange (outbreaks)			
IRELAND. Week ended Sept. 24	...	...	...	...	...	...	2	6	...	1
Corresponding Week in 1909 ...	...	...	...	...	...	...	...	2	...	48
Corresponding Week in 1908 ...	...	...	...	...	...	...	1	4	...	...
Corresponding Week in 1907 ...	...	...	...	...	...	...	2	4	2	37
Total for 39 weeks, 1910 ...	5	8	...	...	1	2	60	364	78	1713
Corresponding period in 1909 ...	6	6	...	...	...	...	67	309	36	1561
Corresponding period in 1908 ...	7	10	...	...	...	...	33	281	141	3247
Corresponding period in 1907 ...	2	4	...	...	5	9	67	199	120	2078

Department of Agriculture and Technical Instruction for Ireland, (Veterinary Branch), Dublin, Sep. 28, 1910

NOTE.—The figures for the Current Year are approximate only.

* As Diseased or Exposed to Infection

EXPORT OF DECREPIT HORSES.

The new Act came into operation on Saturday, 1st. It provides that no horse, ass, or mule, except thoroughbred horses, accompanied by a certificate of the Jockey Club, shall be shipped abroad from any port in Great Britain unless it has been examined by a veterinary inspector appointed by the Board and certified by him to be capable of being conveyed and disembarked without cruelty.

The object of the Act is to prevent cruelty in connection with the trade in decrepit horses to the Continent, and the Board of Agriculture have, in the exercise of their powers, exempted from veterinary examination horses shipped to any port outside Europe, and also any horse intended for breeding, racing, exhibition, or other special purposes, which is accompanied by a permit from them. A fee of 2s. 6d. is to be paid by the owner or shipper in respect of each horse presented for veterinary examination.

The following are the veterinary inspectors appointed at various ports to conduct examinations :—

London.—F. W. H. Smith, M.R.C.V.S., c/o H. G. Rowbotham, Esq., Wilney, Berlin Road, Catford, S.E.
Gavin A. Herron, M.R.C.V.S., 31, Highgate Road, Kentish Town, N.W.
P. J. L. Kelland, M.R.C.V.S., Foreign Animals Wharf, Deptford, S.E.

Leith and Granton.—T. P. Young, M.R.C.V.S., 10, Kirk Street, Leith.

King's Lynn.—W. H. Chappell, M.R.C.V.S., 8, Railway Road, King's Lynn.

Hull.—A. M. Munro, M.R.C.V.S., 20, Heathcote Street, Newland, Hull.
W. Longhurst, M.R.C.V.S., 171, Beverley Road, Hull.

Harwich.—J. E. Miller, M.R.C.V.S., c/o Post Office, Dover Court.

Grimsby.—A. J. Hines, M.R.C.V.S., St. Mary's Gate, Grimsby.

Goole.—J. S. S. Woodrow, M.R.C.V.S., Onslow House, Swinefleet, Yorkshire.

Newcastle and South Shields.—F. Brown, M.R.C.V.S., 15, St. Thomas Street, Newcastle-on-Tyne.

Grangemouth.—Peter Bell, M.R.C.V.S., Westbank Place, Falkirk, N.B.

Liverpool.—J. W. T. Moore, M.R.C.V.S., Woodside Lairage, Birkenhead.

Folkestone and Dover.—H. B. Eve, M.R.C.V.S., Claremont House, Cheriton Road, Folkestone.

Newhaven.—J. C. Munby, M.R.C.V.S., Radstock House, Lewes.

Plymouth.—P. G. Bond, M.R.C.V.S., 105, Union Street, Plymouth.

Southampton.—J. H. Lipscombe, M.R.C.V.S., 2, College Terrace, London Road, Southampton.

Messrs. Smith, Kelland, Munro, and Moore are already on the permanent staff of the board. The remaining inspectors hold temporary appointments, and are remunerated either by an inclusive annual fee or by the payment of a special scale of fees according to the number of horses examined.

Arrangements have also been made with the local authorities of the ports for the appointment of shipment officers, who are in most cases officers of the local police, whose duty it is to countersign permits issued by the board, to see that no horse is shipped without the necessary certificate or permit, and to make a periodic return of all horses shipped. In the case of London, the board have themselves appointed as shipment officer Mr. T. W. Berryman, 9, Bush Lane, Cannon Street, E.C., to act at the Custom House Quay, Irongate Wharf, Brewer Quay, and other river quays. The superintendent of police of the Port of London Authority acts at the London Docks.

Two Second Division clerks have been added to the clerical staff of the board in connection with the new Act, and such further additions will be made as experience shows to be necessary. The whole additional cost of working the Act will be covered by the receipts from fees for horses examined.—*The Standard.*

Scarlet Fever in Relation to Cow's Milk.

Of all the papers read at the Brighton Congress, and there were many of great value and interest, one only stands out as a consecutively reasoned argument, with no digressions nor irrelevance, no trace of prejudice nor assumption of disputable premises ; there is a distinct issue, the evidence is critically examined, the conclusion forced home. We do not reprint the paper, for the subject "Scarlet Fever in Relation to Cow's Milk, is not one of special interest to our readers, nor, indeed, to ourselves : yet we found ourselves listening to Mr. Hunting on this unfamiliar subject with the keenest enjoyment, his relentless logic was an intellectual treat. The paper was, in effect, the demolition of an untenable theory started long ago by Sir George Buchanan, developed by Sir William Power, and since endorsed by Drs. Hamer and Jones, that scarlet fever might arise by infection from the milk of cows suffering some supposed morbid condition, though showing no signs of any recognised disease, and that without any human infection. It was not, of course, disputed that milk may convey scarlet fever : that is a different proposition altogether. Sir William Power rested his theory mainly on the Hendon case which occurred in 1885. Drs. Hamer and Jones supported it on the strength of an outbreak in London and Surrey in 1909. The paper is in the main a critical examination of the evidence in these two cases, and under that examination the theory breaks down hopelessly. This was recognised at once by Dr. Parkes, who opened the discussion, and by another speaker, who, rather needlessly, gave the whole argument over again. Then Dr. Bostock Hill followed on the same lines, but spoilt his whole speech by the final suggestion that while there was no conclusive evidence for Sir William Power's theory, he would not say it might not be true. Dr. E. M. Smith further strengthened Mr. Hunting's position by citing a case in which he had been for some time unable to discover any human source of infection till by chance he found that a hedge-clipper, whose children had scarlet fever, was allowed to milk the cows and take a bottle of the milk home with him. Dr. Armstrong added his testimony and said he had never believed in the Hendon theory ; only Dr. Bond differed on the ground that scarlet fever which was serious in human beings *might be mild in cows!* In the face of this almost universal assent there rose a worthy Chairman of Committee who asked for *something definite.* He had come to be guided, and he found no definite opinion or guidance. There was a suggestion made that it would be well to try to inoculate a cow with scarlet fever to see what happened, and Dr. Cameron, while admitting that the case against the cow was not proved, and capping the story of the hedge-clipper with another instance from his own practice, in which he artfully discovered a human source of infection, protested that though he had not found evidence for the theory *it might be there!* We must not be too dogmatic. To which piece of reasoning Mr. Hunting very properly replied that on the same grounds the horse might be suspected. The origin of the whole blunder was in the method of investigation. Sir William Power thought he had made a great discovery when he noticed that some of the cows in the shed looked different from the rest. They had newly calved, and had just been brought in from the field. This, which was so ordinary to a veterinary surgeon that they did not notice it, seemed extraordinary to Sir W. Power,

and he thought he had discovered a new disease. So it became an article of faith with—Local Government Board doctors, and was handed down from one to the other. As for the inoculation of cows, experiments *had* been made. Both in Edinburgh and in Glasgow they had tried to infect the cow with scarlet fever with negative results. The little slap at the Local Government Board was thoroughly enjoyed by the audience, as was the good-natured sarcasm of the whole reply. Mr. Hunting showed, in his capacity of Chairman of the Conference, the same critical instinct when debate ran high on the question of compensation should an attempt be made to stamp out tuberculosis in cattle. If he had not been an F.R.C.V.S. he might have been a lawyer of the first order.—*The Contract Journal.*

ASSOCIATION OF VETERINARY OFFICERS OF HEALTH.

The annual meeting was held in the City Chambers, Glasgow, on Friday, Sept. 30th. Representatives were present from all parts of the United Kingdom. Following the business meeting a conference was held, at which various veterinary problems in their relation to public health were discussed. On the subject of the eradication of animal tuberculosis—on which papers were contributed by Prof. Bang, of Copenhagen, and Prof. Ostertag, of Berlin—the conference passed a resolution urging the Government to take action by slaughtering all cases of open tuberculosis, by encouraging the formation of tubercle-free herds, and by enforcing the provisions of the Dairies, Cowsheds, and Milkshops Orders. Other subjects discussed were the standard of fitness of flesh meat for human food, the question of infection through cows' milk, and cancer in domesticated animals.

The conference was preceded by the the business meeting of the Association. Mr. J. S. Lloyd, President, presided, and between 40 and 50 members attended.

On the motion of the Chairman, it was decided to elect as honorary members Prof. Bang, of Copenhagen, and Prof. Ostertag, of Berlin. Prof. Bang's work, the Chairman said, was well known throughout the whole word. Prof. Ostertag had the confidence not only of the veterinary profession of Germany but of his Government, as was shown by his appointment to succeed the celebrated Dr. Koch. (Applause.)

It was unanimously resolved to invite Mr. William Robb, F.R.C.V.S., of Glasgow, to become President of the Association for next year.

Mr. A. M. Trotter, veterinary surgeon to the Corporation of Glasgow, was unanimously re-elected Secretary and Treasurer.

Edinburgh was chosen as the centre for next year's meeting of the Association.

Uniformity of Meat Inspection.

The Chairman, in the course of his address as President, referred to the representations made to the Presidents of the Local Government Boards of England, Scotland, and Ireland, asking each of these central authorities to appoint a veterinary surgeon under the Board, and also urging the establishment of a uniform system of meat inspection. As the outcome of these representations Scottish local authorities and public bodies had, he intimated, arranged to send a combined deputation to meet Lord Pentland in the course of next month. It was the aim of the Association to try to do something to better the position of the veterinary inspector as a meat inspector. As a member of the Council of the Royal College of Veterinary Surgeons he had already taken action in this matter. He had a proposition on the agenda for the next Council meeting something on the lines of Section 100 of the Swansea Corporation Act (1902) with regard to the extension of powers of veterinary inspectors in England. His proposal sought powers for veterinary inspectors as meat inspectors equal to the powers enjoyed by medical officers of health under the Public Health Act (1875), Section 116.

Animal Tuberculosis.

The subject of "The Eradication of Animal Tuberculosis," on which Prof. Bang, of Copenhagen, and Prof. Ostertag, of Berlin, contributed papers, was introduced by Mr. J. Malcolm, F.R.C.V.S., Birmingham.

Tuberculosis, in Prof. Bang's opinion, was purely a contagious disease. It was true, the paper stated, that infection might take place in the uterus, so that the calf was born tuberculous, but that happened very rarely, practically only when the cow was highly tuberculous. There was no reason to kill milch cows that did not show clinical signs of tuberculosis, but only reaction to tuberculin. So long as they were stabled in isolated stables there was no reason why they should be killed or why their milk should not be used and calves bred from them, provided the latter were as soon as possible removed from the infected stable and were not infected by being fed on the raw milk of tuberculous animals. The highly tuberculous animals should not of course be allowed to form part of the stock, but should be killed as soon as possible—a measure which had certainly been taken rather oftener in former times, though not nearly as often as circumstances demanded. It would be seen that these measures for combating tuberculosis among cattle interfered as little as possible with the breeding. Prof. Bang wanted farmers to remove from their st ock only such animals as from reasons of general economy they would feel inclined to remove, *i.e.*, the animals that a merely clinical examination proved to be tuberculous. They were allowed to keep those that did not appear tuberculous until subjected to the tuberculin test as long as they found they yielded sufficient milk, and to breed their calves if only they took good care to keep the latter isolated from the perfectly healthy animals.

Prof. Ostertag, in his paper, summarised his conclusions as follows :—(1) In order to effectually check the further spread of tuberculosis in cattle and to suppress the disease gradually but comprehensively State control was necessary ; (2) the control must be limited to all open cases ; (3) all such cases must be notified ; (4) cattle so affected must be slaughtered with the least possible delay on adjustment of compensation and their stands and immediate surroundings disinfected ; (5) to prevent the spread of tuberculosis by means of milk residue from collecting dairies, skimmed and butter milk and they must be heated before use as food and centrifugated slime rendered harmless; (6) voluntary measures must be encouraged in furtherance of State action ; (7) uniformity of State practice and effectiveness of private action must be secured by the establishment of a central court for the control of tuberculosis in the domestic animals.

In the course of the discussion which followed, Mr. Gooch, Stamford, said that unless they had State control of sera it would be impossible to carry out Prof. Bang's methods in this country.

Mr. Parker, Newcastle, commented on the fact that very little was said in both papers regarding the hygiene of buildings. They must decide, he thought, as to whether they were working for the benefit of the public health or for the benefit of the farmer himself. He was inclined to think that, no matter what other measures were adopted in this and other countries, unless they attacked the question of buildings it seemed hardly possible for them to stamp out tuberculosis within many years.

Mr. Watson, Dublin, claimed that Ireland was very much freer from tuberculosis amongst its bovine subjects than either Scotland or England. This fact might be

attributed to the habit of Irish dairy proprietors of housing their cattle under roof for only about five months of the year.

Mr. DOUGLAS, Kilmarnock, said that while legislation seemed very long in coming, they could, he thought, do a good deal themselves. Certainly the hygienic question was a very important one. Not so many years ago Ayrshire farmers, he said, were inclined to have their cows housed early in the autumn and kept warm and comfortable. It is now fairly generally recognised that cows ought to be kept in cool sheds and allowed out in the open as much as possible. They had some herds in Ayrshire which had been freed by the tuberculin test. They had been working the test about 12 years at least, he thought, and they had some farms quite free from tuberculosis by breeding from their own cattle. Prof. Bang's method was certainly expensive, but he would say frankly that it paid the farmer well ultimately. If a man's herd was known to be free from tuberculosis he could get a very handsome price for his heifers.

Mr. MALCOLM, replying to the discusion, said that some one had advocated State testing of herds. What, in his opinion, was wanted was to get the State to recognise clinical or open cases as a contagious disease. When they had gained that recognition they could make a start. Let them demand a minimum which they were satisfied was going to do some good.

On the motion of the Chairman, a resolution was adopted urging "the Government to take immediate measures to diminish the frequency of tuberculosis in food animals by the slaughter of all cases of open tuberculosis, by encouraging the formation of tubercle-free herds, and by the universal enforcement of the provisions of the Dairies, Cowsheds, and Milkshops Orders."

A resolution was also adopted stating that "it is imperative that the manufacture of tuberculin ought only to be permitted in the approved laboratories, and that it is issued only to members of the medical and veterinary professions."

It was agreed that a copy of each resolution be sent to the Presidents of the Local Government Boards for England, Scotland, and Ireland, the Board of Agriculture for Great Britain, and the Department of Agriculture and Technical Instruction for Ireland.

CANCER IN ANIMALS.

Dr. J. A. MURRAY, B.SC., M.B., CH.B., of the Imperial Cancer Research Fund, read a paper on "Cancer in Domesticated Animals," in the course of which he showed several growths from animals. It would, he said, be like carrying coals to Newcastle to tell veterinary surgeons that animals were subject to cancer, but there were not many people aware that the disease in animals was identical to that which afflicted man, but it was not transmissible nor communicable from animals to man or from animals of one species to those of other species.

Mr. A. M. TROTTER (Glasgow) said that ten years ago it was denied that cancer was ever found in the lower animals, but he was sorry to say that cancer was an exceedingly common disease in the lower animals. Glasgow was very favourably situated for obtaining specimen cases. Many of the old cows slaughtered in Glasgow, he was sure, were 20 to 30 years old. (Laughter.) He thought that some of their Irish friends would say that Ireland produced good men ; she also produced splendid specimens of cancer in cattle. Of about 300 cases which he had had under observation, certainly 275 were from Irish cows. The chief seat was in the liver. In bovine animals cancer of the liver was exceedingly common. Of the 300 cases referred to, possibly 200 were cases of primary cancer of the liver. But no part of the body of the lower animals was exempt from affection by cancer.

FIT AND UNFIT FOOD.

Professor JOHN GLAISTER (Glasgow University) read a paper on "The Significance of Moulds or Fungoid Growths on Flesh Meat with Relation to Fitness for Human Food." He was of opinion that the conditions in flesh meats which invited the growth of fungi externally also determined in great measure the invasion of the meat by micro-organisms of different kinds, some of which were known to be injurious to man. The sale of meat more or less covered externally with moulds differed from the sale of an article like cheese, which was ostensibly mouldy, because moulds in the latter constituted an essential part of the nature and quality of the article. Meat therefore, which presented a moulded surface ought always to be looked upon with suspicion, not merely because of the moulds, but because the presence of the moulds was an indication of internal changes in the meat, which might or might not be rendered innocuous by cooking. In this connection Professor Glaister referred to the greater danger which was run by the man who preferred his flesh meat underdone in the cooking. The important question yet to be decided was, what should be the standard by which the fitness or unfitness of flesh meat for human food should be gauged—was it to be a question of the nature and quality of the substance bought, or was it to be a criterion of fitness after efficient cooking ?

Mr. A. M. TROTTER (Glasgow) said that his candid opinion was that meat covered with moulds ought to be condemned. (Hear, hear.) Moulds must necessarily be the result of improper refrigeration. He thought the time would soon come when cold storages would be placed practically in the position of bonded stores. Refrigeration could only keep meat for a certain time, and he thought there should be a limit to the period of refrigeration. The United States had taken the matter in hand, and he understood that they were pushing through the Congress a Bill which would provide that no meat would be kept after a certain period ; it would either have to be destroyed or taken out of the cold storage.

Mr. WATSON (Dublin) thought that it was not the veterinary profession that required to be stirred in the matter, but the colleagues of Prof. Glaister.

The CHAIRMAN said that it was the duty of meat inspectors to protect the public, and the latter's sympathy should be with them.

Professor GLAISTER, in replying to the discussion, said that he did not believe that the question of efficient cooking should enter into the standard of fitness.—(Applause.)

MILK AS A CARRIER OF INFECTION.

Prof. A. GOFTON, Royal Dick Veterinary College, Edinburgh, contributed a paper on "The Relation between Scarlet Fever, Diphtheria, and Sore Throat of Man, and Diseases of the Udder and Teats of Cows."

Prof. GLAISTER said that he thought Prof. Gofton had reached a right conclusion when he came to the opinion that there was no proof of direct relationship between scarlet fever in the human subject and the so-called "Hendon disease" and allied conditions of the lower animals. His opinion was that milk with certain microbic constituents did give rise to a form of sore throat. But they should be cautious in the meantime in arriving at any rash opinion as to any possible relationship between the milk of the cow and so-called scarlatina in the human subject.

After further discussion, Prof. Gofton replied.

A vote of thanks having been accorded to the authors of the papers, the conference terminated.—*The Glasgow Herald.*

At the Conference of Veterinary Inspectors all the three papers read dealt with the question of milk, and were among the best presented to the Congress, being well-written, readable, and informative. One paper was devoted to a consideration of "Scarlet Fever in Relation to Cow's Milk," and discussed very thoroughly the

hypothesis, revived in 1909 by Drs. Hamer and Jones' that outbreaks of milk-borne scarlet fever might be due to some undefined disease of the cow, the conclusion being that "when an udder disease of cows is found in a cowshed the milk from which spreads scarlet fever, we may safely acquit the cow of any share in the outbreak, and concentrate attention upon finding a human source of infection."

In his plea for the veterinary inspection of dairy cows and cowsheds Prof. Woodruff emphasised a point which we urged last month in dealing with Dr. Newsholme's Report on "Infant and Child Mortality." Professor Woodruff pointed out that milk is peculiarly liable to be a carrier of disease, and that epidemic diarrhœa (which is such a fruitful cause of death among infants) is most frequently due to the consumption of infected milk. —*Local Government Review.*

Personal.

BLAKEWAY—CORBETT.—On 5th inst., at Weston Parish Church, John Blakeway, F.R.C.V.S., to Lucy Wright Corbett, widow of the late Frank Corbett, and only daughter of the late Thomas Boulter, of Hartlebury.

On Saturday evening, Sept. 24th, a large company of the leading agriculturists in the Buchan district met in the Commercial Hotel, Longside, and presented Mr. John Beattie, M.R.C.V.S., with a handsome pocket-book, containing a cheque for £82, in recognition of his distinguished services to farmers and stockowners. Mr. George Robb, cattle dealer, Maud, presided, and the presentation was made by County Councillor Annand, Peterhead.—*The Scottish Farmer.*

ARMY VETERINARY SERVICE.

Extract from *London Gazette*,

WAR OFFICE, WHITEHALL, Oct. 4.

ARMY VETERINARY CORPS.

The undermentioned officers from the Unattached List for the Territorial Force, to be Majors, with precedence as in the Unattached List for the Territorial Force:—

Vet.-Majs. A. Porritt, W. G. Dixon, and D. M. Storrar, F.R.C.V.S.

To be Captains, with precedence as in the Unattached List for the Territorial Force:—

Vet.-Capts. H. C. Harrison and G. M. Davey.

To be Lieutenants, with precedence as in the Unattached List for the Territorial Force:—

Vet.-Lieuts. D. S. Davidson, H. Anthony, W. V. Tuson, J. Adamson, F. G. Edwards, H. G. Westgate, A. Walker, F. Rankin, J. Soulsby, T. Wilson, R. F. Watson, C. E. Neill, W. K. Barron, J. S. Bowden, S. Smith, A. J. Curtis.

Vet.-Lieut. R. D. Williams, to be Vet.-Lieut., with precedence as in the Volunteer Force. Dated July 8.

Col. E. H. Hazelton, F.R.C.V.S., A.V.S., has been appointed Principal Veterinary Officer, Aldershot Command, *vice* Col. R. Pringle, C.B., D.S.O.

OBITUARY.

HUGH M. SINGLETON, M.R.C.V.S., Ealing, London, W. Graduated, Lond: July, 1881.

Mr. Singleton was born in Co. Clare, and entered the veterinary profession rather later in life than is usual. Death occurred at his residence, 6 Florence Terrace, on Thursday, 29th Sept. from heart failure following bronchitis. His age was 70.

ALBERT EDWARD CATT, Maidstone, Kent.
Lond: April, 1870.

Mr. Catt died on Tuesday, Sept. 20th, from cirrhosis of liver with heart complications, aged 62 years.

Mme. Pasteur.

Mme. Pasteur, the widow of the great French bacteriologist, died at Arbois, in the Jura.

Mme. Pasteur, who was in her 85th year, was the daughter of M. Henry Laurent, Rector of the Academy of Strassburg. She married M. Pasteur in 1850, and the admirably-written life of that great man by his son-in-law, M. Valéry Radot, shows how his achievements were facilitated and his task lightened by the blessings of the ideal home that she made for him. She was a woman of great energy, and her intellectual faculties remained clear and vigorous to the end.

A NEW VETERINARY DICTIONARY.

Sir,

In reply to your correspondent on the above subject. I venture to point out that the work in question is to be published by a firm who also supply ready made medicines for the use of farmers. The same firm publish an agricultural paper which is edited by the author of the "Veterinary Dictionary."

In this paper a series of articles occurs dealing with the treatment of various diseases in animals, and the readers are advised to use the ready made medicines supplied by the publishers. Moreover, these medicines are advertised in the paper as specially suitable for farmers attending County Council lectures. Also the "Veterinary Dictionary" is advertised in this paper.

Now, in the face of these facts, how can the author have the temerity to invite his professional brethren to become subscribers to his work, which is obviously intended as a popular veterinary educator?

The circular and portrait which have been sent out to veterinary surgeons would lead one to suppose at first sight that a practical joke had been perpetrated. The announcement in the agricultural paper, however, shows that the author is really in earnest.

If the author desires to issue a popular veterinary dictionary, that is his own affair. But when he invites the co-operation of his professional brethren, as subscribers to such a work, it is hardly likely that even the attraction of the circular in which he is portrayed in "purple and fine linen," will have the effect he desires.—Yours, etc.,

"PRACTITIONER."

Sir,

The Veterinary Record of the 6th inst. is before me. I looked at right hand column on page 86, what am I to understand? The upper part of the column describes the Royal visit to the Army Veterinary School. Aldershot, and the short note at the foot deals with "Vetting" for the Cawdor Cup.

Your desire is, I take it, to advance the veterinary profession so far as you can, and to place it on an equal footing with the other learned professions. Do you think the wording of your article on "vetting" for the Cawdor Cup is calculated to do this? With one hand you place us on a high level, with the other you tell us we are just people who "vet" animals

I simply bring this matter to your notice hoping that all notices or articles in your paper will show that veterinary surgeons are trained professional men, not simply "Vets.": a term which conveys nothing to the mind of the ordinary man as to the professional qualifications of the person described as such.—Yours faithfully, J. M. CHRISTY.

Dep. of Agric., S. Africa.
August 29.

[The title complained of was none of ours. It was a quotation from a contemporary.]

COMMUNICATIONS AND PAPERS RECEIVED:—Messrs. J. M. Christy. A. Watson. *The Standard, The Daily Mail.*